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Rail-Road News.

Mobile and Girard Railroad.

The commissioners of this important enterprise have lately visited New Orleans and received from her citizens a very large subscription to the stock. When this route is finished, New Orleans and New York will be seventy-six hours apart. The distance is 1,497 miles by the way of Wilmington, Branchville, Augusta, Macon, Girard, and Mobile. The distance from Mobile to New Orleans is 160 miles, to be traversed by steamer in 10 hours. The length of this road is to be about 230 miles: cost of road formation, which includes grading, drawing, and building, is estimated at $1,472,000; cost of superstructure, wood, and iron, $1,158,000; equipments for road, including machinery and station houses, cars, etc., $300,000, making an average cost of $12,000 per mile. It is estimated that it will pay 16 per cent per annum on the capital stock. The traveller from New Orleans will not hesitate in availing himself of this direct line of railroad, in preference to the meandering of a river with all its dangers, delays and uncertainties. If he does not regard the time lost in fogs, and upon sand banks, his care for personal safety will not fail to remind him of the fires, explosions, and other disasterous accompaniments to western navigation, and to whichever point in the great segment radiating from Nashville to Savannah he may be destined, he will take his departure from the gulf by the Girard Railroad. This will also be the case in going South.

Railroads in Russia.

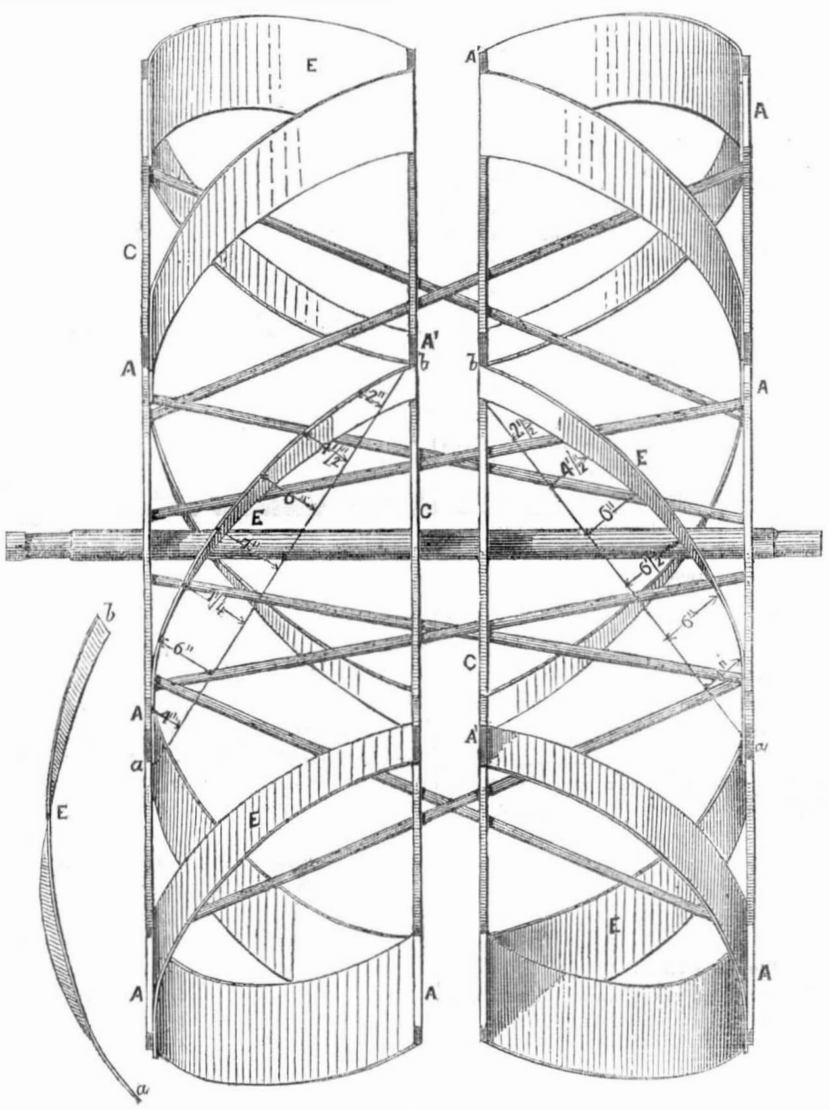
Major Brown, our countryman, the consulting railroad engineer of the Emperor of Russia, states in a letter, that the Emperor has determined, as soon as the season will allow, to commence the projected railroad from St. Petersburgh to Warsaw, the surveys for which were made last year. Major Brown will, by his position, have the chief superintendence. The distance in this instance to run is from 750 to 800 of our miles, and stretching, for the most part, through an inhospitable tract of country, intersected by many rivers, broad morasses, and lowlands. The railroad will be begun in the latter part of May, and its completion will quicken into activity the internal commerce of Northern Europe.

The railroad from St. Petersburgh to Moscow, of which our talented countryman, Major Whistler, was Chief Engineer when he died, is now nearly finished. It is 421 miles long.

Length of American Railroads.

It is calculated that at the end of 1851, there will be 10,600 miles of railroads in operation in our country; and with those which have already been contracted for, there will be 2,000 miles more constructed in 1852. No country in the world can equal ours for the number of railroads.

CHAPMAN'S SPIRAL PADDLE WHEEL.---Figure 1.



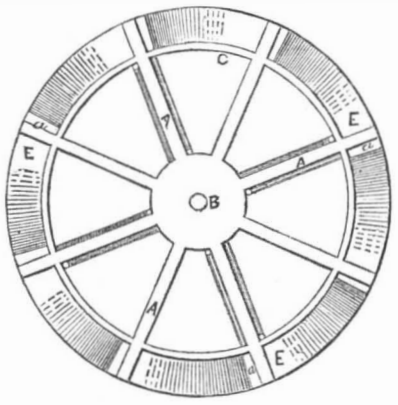
This paddle wheel for steamships and steamboats, is the invention of Abner Chapman, of Fairfax, Franklin Co., Vt. A patent was secured for it last year in England.

Fig. 1 is a front elevation of the wheel, with an edge view of one of the paddle, beside it.

Fig. 2 is a reduced side elevation. The same letters refer to like parts.

Each paddle or blade is made of a curved and twisted or winding form, and there are two sets of such paddles on each wheel, with a space between them, each paddle of one set is placed opposite to its fellow on the other set, each pair forming a figure of a semi-eliptical form, with an opening at its vertex. The

FIG. 2.



wheel has four sets of radial arms, A A A A. They are seccured in bosses made fast upon the shaft, B, and bound together by bolts to the rings, C C C C. The paddles or buckets, E E, are made of plates of metal, each in the form of the section of a flat ring, the circumference of which is equal in diameter to a circle circumscribing the outside of the wheel when complete, and the distance between whose inner and outer diameters is equal to the required depth of the paddle. Each blade is twisted as follows:—The buckets are supposed to be when curved about 7 feet 9 inches in length, in a straight line from end to end of the outer edges, C, commencing at the end, *a*, its deviation from the straight line, at one foot from *a* is four inches, at two feet six inches, at 3 feet seven and a quarter inches, at four feet it is eleven inches; at five feet it is six inches, at six feet four and a half inches, and at seven feet two inches. Their length from end to end in a straight line, is about 6 feet 9 inches on the inner edge. There is an elevation from the straight line on both edges, thus giving the blade a slightly twisted form as represented by the edge view, E *a b*. Each blade is secured at its end, *a*, close to the inner face of the radial arms, A A, of one of the outside sets; and at its opposite end, *b*, close to the front edge of one of the arms, A′ A′, of the corresponding inside sets, at a distance behind that to which the end, *a*, is secured. Each pair of blades resembles a single bucket with an opening between them. These buckets enter the water edgewise in such a manner as not to displace it until the bucket arrives at a proper position to exert its propelling power. The buckets being set opposite to one another have a tendency to throw the water towards one another, thereby gathering the water in such a manner as to enable the blades to exert their leverage on a firmer fulcrum, if we may be allowed to use such an expression. The oblique position of the blades with the opening between them, allows the escape of backwater, and prevents waterlift. This paddle wheel was applied to the steamboat *Santa Claus* belonging to this city, and her speed, without any other alteration, was increased one third. The great jarring to which she was subjected by the old paddle ceased at once, and she sailed along with a gentle steady motion.

Hair of Different Races of Men.

Mr. P. A Brown, of Philadelphia, has communicated to the American Ethnological Society, an essay entitled "the Classification of mankind by the hair and wool of their heads," with an answer to Dr. Prichard's assertion that the covering of the head of a negro is *hair* and not *wool*. He states that there are, on microscopic examination, three prevailing forms of the transverse section of the filament, viz:—the cylindrical, the oval, and eccentrically elliptical. There are also three directions in which it pierces the epidirmis, and is prolonged to its apex. The straight, and lank, the flowing or curled, and the crisped or frizzled, differ respectively as to the angle which the filament makes with the skin on leaving it. While the cylindrical and oval pile has an oblique angle of inclination, the eccentrically elliptical pierces the epidermis, at right angles and lies in the dermis perpendicularly. The hair of the white man is oval; that of the Choctaw and some other American Indians, is cylindrical; that of the negro is eccentrically elliptical or flat. Hair, according to these observations, is more complex in its structure than wool. In hair the enveloping scales are comparatively few; in wool they are numerous.

Anhydrous Steam---Stame.

A few weeks ago we requested some of our correspondents to send us the results of any experiments they had or might make about testing the principles of steam changed into *stame*, as Mr. Frost terms it, by exposing steam to a hotter surface than its own specific heat, apart from the water in the boiler. The following is the answer of one correspondent:—

"I tried the experiment of heating steam separate from the water, in 1848, with a six horse-power engine, whereby I saved one quarter of the wood. In 1849 I tried it on a steam boiler 28 feet long and 2 feet in diameter, and supplied steam for a 7 inch cylinder and 15 inch stroke, with 300 revolutions per minute, with 90 pounds of *stame* per square inch, and before heating the steam it would not make steam for a 5 inch cylinder, 24 inch stroke, 25 revolutions per minute. I have since run a one horse-power with *stame*, and found it to be a great saving of fuel. I heat my steam in a cylinder at or near the back end of the boiler." W. G. WHIPPLE.

Westfield, Mass.

[In answer to a correspondent, last week, we stated that we would give an abstract of Dr. Haycraft's experiments with *stame* (he proving it to be anhydrous steam) this week, but owing to the number of other articles which are somewhat long, and which we could not avoid inserting this week, we defer the remarks spoken of for a week longer.

Artesian Wells.

It is proposed by the citizens of Montgomery, Alabama, to supply that city with pure water by boring one or more artesian wells on Capital hill. In connection with the project, it is stated that a plan or machine for boring artesian wells has been invented by Dr. C. A. Woodruff, which will effect a great economy of time and labor in such excavations. It is the opinion of Dr. W. that, with the apparatus furnished by him, almost any quantity of water can be had on Capital Hill at a depth of five or six hundred feet, for the very small expense of three hundred dollars.

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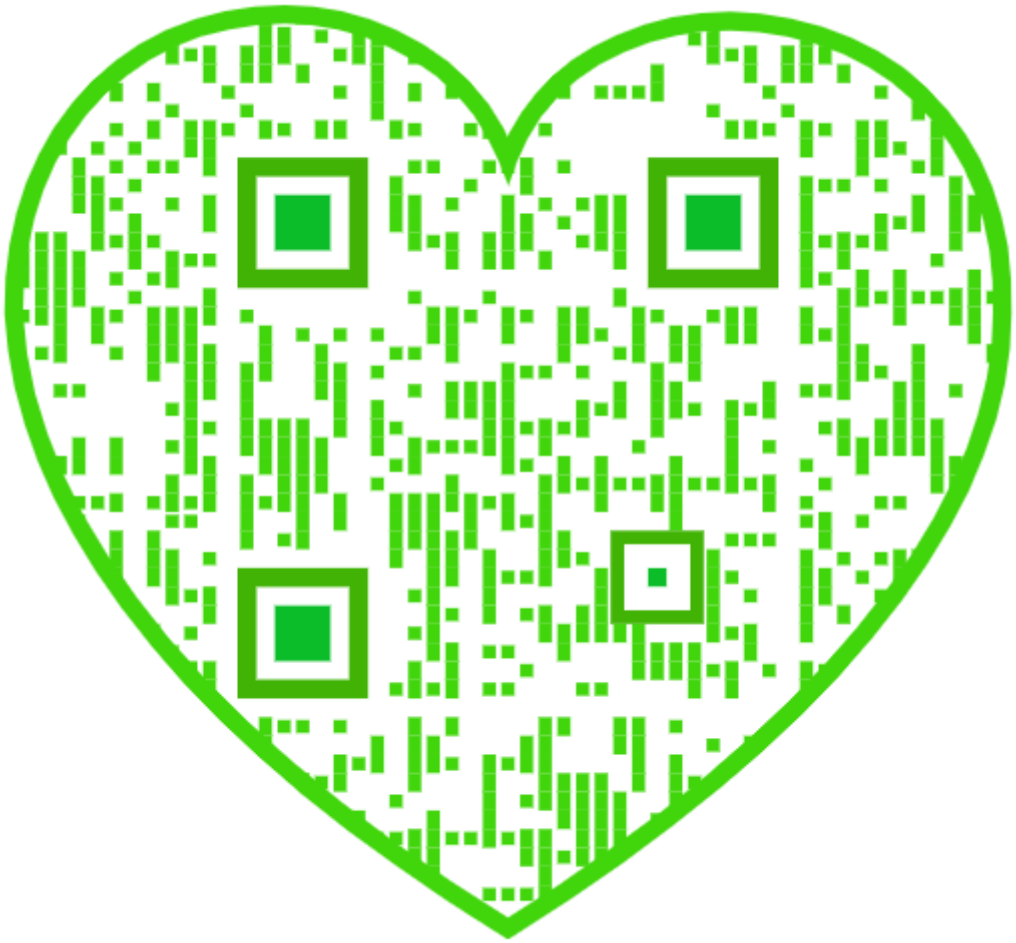

Miscellaneous.

Foreign Correspondence.

The Great Exhibition of 1851, and Incidents Connected therewith.

London, April 10, 1851.

The Palace of Glass is at length completed, and almost hourly arrivals of goods are taking place from all the civilized quarters of the globe. The scene in the interior of the mammoth building is one of active industry, —and such a clattering, constructing, tearing away and refixing, knocking down and apportioning, we never before witnessed. Every hand is busy, and there is no such thing as idleness, if we except the strolling scribes, who, like myself, pay a visit in order to find matter for their jottings-down. It is wonderful what a concourse of visitors there are every day to gaze upon the exterior of this extraordinary pile, and the panorama of life in the neighborhood of Hyde Park will vie with the most picturesque in the world. We have seen Russians, Chinese, Turks, Hollanders, French, English, and Americans, all in one group—and all straining after the same object, and doubtless acted upon by the same impulses.

London is filling up with strangers—literally *filling up*,—and it is a vast metropolis, with its thousands of avenues and arteries to show an increase of population, yet such is the case, as its crowded streets and thoroughfares will attest. As yet the great bulk of the foreign visitors have been French and Germans, and we not unfrequently see a "Down-Easter" inquisitively stretching his neck to get a view in the Palace windows. He must abide his his time; in a few weeks the doors will be thrown open, and then he can gratify his love of the arts to his heart's content.

At every grant of favorable weather the painters and glaziers have been indefatigable in painting and stopping up the deficient parts of the roof. The "Chronicle," a few days ago, remarked, "The scene which some five hundred or more workmen presented, while creeping through the long unbroken valleys and over the gently undulating and seemingly fragile ridges, was exceedingly interesting. The irregular manner in which they were dispersed over the extended glassy surface, reminded visiters of a body of skirmishers or light infantry, preceding the main body of an army, while others mounted on the lightladders placed against the sides, would have led to the conclusion that a scaling party were mounting the crystal walls."

On Monday last a strike took place among the workmen of the Palace. It appears the men demanded additional time for meals to make up for that lost to them in coming down and going up to the roof of the building. A satisfactory arrangement was effected, and the greater number of the men returned to work. These differences are to be regretted, for, as a a journal of the day truly observes, "one great anticipation of the Exhibition was the cementing a reciprocity of feeling between the artisan and his employer."

It has been decided that the prices of articles will influence the award of the juries; as at a large expenditure excellence may be produced, while a low-priced article may possess both quality and execution comparatively superior. This is as it should be.

Yesterday the Austrian ship "Anna VI." arrived in the Thames with an entire cargo of Austrian products. As they are not as yet unpacked we are unable to tell what they are, the Commissioner having produced no list.

The official catalogue of the Great Exhibition is very rightly considered here as a monopoly, and as such tending to lower the character of the Exhibition. The compilers, not content with the simple arrangement of the accounts filled up in due form by the exhibitors, but placing it in small type, have set, in large type, an account of their own opinion as to the facts of the description and the practical uses of the articles. It is said that one catalogue has been set aside and another is to be issued, and it will redound to the integrity of the Royal Commissioners and the E cutive Committee, if this be true. Juries have been appointed to decide on the merits of articles exhibited, and to these jurors belong that prerogative, without any interference on the part of interested compilers who seek to pass opinion with closed doors and without examination of the deposits.

We see advertisements continually in the German papers, of articles on exhibition previous to being sent to London to the Industrial saturnalia. In Manheim, a gentleman named Hecket has inventedand prepared two transparent plant-pictures of Prince Albert and Queen Victoria, each of them eighty-one centimetres high and sixty-eight broad. The plants are made use of in the condition nature produces them, without addition of coloring or any other matter. The names "Victoria" and "Albert," the crown, and ornaments, are made of various kinds of mosses, carefully *laid* with due regard to size and color. We have no doubt that this ingenious and beautiful work will attract great attention when it arrives.

In consequence of a jealous feeling existing among the French contributors, in regard to their allotment of space, which they contend is insufficient for their wants, a meeting has been held in Paris to take into consideration the expediency of erecting a rival Crystal Palace in Paris. It was calculated that it could be done at a cost of 600,000 francs, and that an additional 200,000f. would cover all expenses. Much discussion ensued, but the meeting adjourned *sine die*, so that very little is to be feared, as the project comes at too late a day to be carried into effect. H. H. P.

London, April 11th, 1851.

The machinery, goods, and articles are now in the progress of arrangement in the Exhibition Building, and that with great rapidity. The British and French departments are farthest advanced. Our exhibitors are somewhat behind in the arrangement of their goods; this is owing to the conduct of the Agent Mr. Stansbury, who, was sent along with the goods; but the matter is now arranged, and Mr. Riddle, our Commissioner, is attending to the business with all dispatch. I believe, from the specimens of American articles now unpacked, that our exhibitors need not be ashamed of their productions, so far as they relate to the really useful.

A number of grand specimens of sculpture —or rather works of plastic art—are arising every day from their boxes to astonish and command admiration. There is a gigantic plaster figure, from France, of Godfrey de Bouillon, and there is a monster bronze lion from Bavaria. Up to yesterday there were 10,000 packages of British goods received, and 9,322 from abroad.

A bill to protect designs, so as to benefit exhibitors, was read a third time and passed both Houses of Parliament on Monday the 7th inst. Prince Albert is unremitting in his attention and visits to the Exhibition. He is the real head and projector of it.

Considerable trouble was experienced for a while about raising the funds for decorating and fitting up the American department, but I understand that Mr. Riddle has managed to "go ahead" in this respect. It was not anticipated by our exhibitors that they would have to provide such fittings, and be at so much expense—but the true American is like an india rubber ball, the harder you throw him down the higher he bounds up.

Every day developes more and more the magnitude of the coming Show. All hands have volunteered and have departments of the preparations and decorations assigned them.

Mr. George Peabody, the American banker in London, has directed Mr. St. John, of Buffalo, who has charge of National Decorations, to procure as splendid a United States flag at his expense as may be desired. The United States coat of arms will occupy the east end of the great aisle. It is now contemplated that the eagle's wings are to be each sixteen feet long, and the rest in proportion, of course, the whole probably relieved by the Niagara Falls on the right, and the towering Alleghenies on the left, as back ground.

Excelsior.

[It will be observed that our correspondents in London are awake to the importance of furnishing us with important information connected with the Exhibition. We have some statements sent by each, exactly alike, these we prune and present only in one letter. Our correspondence will be very valuable for reference. It will be of the most interesting kind. —[Ed.

Extraordinary Rifle Shooting.—The Ceylon Times gives the following account of some extraordinary experiments in rifle shooting. The two rifles used were made in Paris, and had each four grooves, and did not appear to differ in weight or length from the rifles in common use:—"A target, about six feet square, was pitched on the sea-road of the Galle face, which was placed the enormous distance of 900 yards from where the gentlemen practising stood. A tripod stand was used on which in a groove, the rifle was placed at a rest."

"After witnessing several shots from the stand we left for the target. To our surprise we noticed that, although the bull's eye was not pierced, there were several shot holes in a good direction above it, as well as below, perforating the inch planking of which the target was made with a well-defined round hole, similar to what a common rifle would make at a distance of 100 yards—a proof of the enormous range and power of the rifle used. We may instance a curious fact in accoustics on this occasion. On leaving the firing place for the target, when about 200 yards off, we heard the rush of the ball, followed at a perceptible interval by the sound of the rifle; getting farther off, the period between the two sounds visibly decreased, until at the target the sound of the explosion reached us before that of the ball. Sound, of course would travel at its accustomod rate of 1,080 feet a second; but where the balls had, at a range of 900 yards, the velocity necessary to pierce an inch plank and fly far beyond it, it would be a fair presumption that the velocity would even be greater than that of sound. The marvel of the vast range must consist in the form and make of the ball used. These were made in the shape of a pine cone, rather smaller than the bore, and with a hollow orifice in the centre running from the base to the apex. Before placing the ball in the piece a small capsule of iron is slightly affixed to the exterior of the hollow in the ball, which is then rammed down. In the act of firing the explosion of course, forces the iron capsule up the whole length of the hollow in the ball, and in so doing it expands the cone, which of course fills up the grooves of the rifles exposing the whole base of the bullet to the action of the powder, without allowing the slightest windage, which takes away, in ordinary rifles, so much of the explosive force of the powder. At first sight we imagined that the rifles used were the farfamed "needle guns" of the Prussians, which have so immense a range, and which bid fair to be such formidable opponents to field artillery, where the effective striking force of the rifle ball is 800 or 900 yards' distance, with equal certainty with that of the common musket or rifle—namely, 200 and 250 yards respectively."

Minot's Light House.—During the severe storm at the East two weeks ago, the light house on Minot's Rocks, 17 miles from Boston, was swept away like a broken reed, and two men drowned. It was a building 75 feet high, and was built on piles sunk five feet in the rock, the diameter of which was 8 inches at the base, 4¼ at the top. On these piles were nine iron pillars sustaining the keeper's house, the floor of which was 60 feet from the foundation. The breadth of the base of the structure was 25 feet; the keeper's room measured from out and out, 14 feet. The keeper's house, resting on the pillars, weighed 30 tons, and was 40 feet from the sea. Although so heavy it would rock like a cradel in heavy storms.

The keeper of Minot's Lighthouse, Mr. Bennett, as well as most others acquainted with the case, are of the opinion that no Lighthouse can ever be erected on Minot's Ledge of any other material than solid rock, similar to the world-renowned Eddystone lighthouse. It is stated that the cost of Minot's Lighthouse was $39,000. It was commenced in 1847—a single pile only being laid that year. In the season of 1848 all the piles, the cap and the braces were put up, but nothing was done towards erecting the house or the lantern, as the entire season was consumed in drilling the holes into the rocks for the piles. During the year 1849, the work was completed, and on the 1st of January, 1850, it was lighted, and since that time the lighthouse has been regularly occupied up to the time of its destruction.

Protecting Plants from Insects.—Prof. Mapes says, "We last year procured from a snuff mill a barrel of dry, but damaged snuff flour, and prepared dredging boxes, covered with a fine bolting cloth, with which we sifted it over the surfaces of any plants attacked by insects, and with most signalsuccess. The snuff should be applied, if practicable, while the plant is wet with dew, and repeated after every shower. If the boxes are properly made, (like a common flour dredge,) and the snuff is perfectly fine and dry, but a little time is necessary to go over an acre of plants. Even the rose bug, cabbage louse, thrips on grape vines, &c., all yield to the influence of snuff, and the most delicate plant of the hot-house is not injured by its application. For field vegetables, caustic lime, made into fine powder while dry, and applied before slacking by contact with the air, will produce similar results.

Preservation of Vegetables for long Voyages.—At the last meeting of the Horticultural Society, London, various dried vegetables, such as peas, haricot beans, Brussels sprouts, carrots, turnips, &c. were exhibited from Peyrusset, Moller & Co., of Paris. These were stated to have been dried by a process peculiar to M. Gannal, the celebrated embalmer of animal substances. This process is understood briefly to consist in dividing the larger vegetables into pieces, and placing them in an apparatus, into which dried air is driven, until they have parted with all their water, and have become perfectly dry. In this condition they may be preserved for any length of time, and it is said that their flavor is not at all interfered with, inasmuch as nothing is taken from them except the water they contained, and that, after they are cooked, they are as good as when fresh gathered. If these facts, therefore, are borne out by experience, the discovery is a very important one, even as regards vegetables, more especially to ship owners, for they can be furnished in this country in any quantity and at a very cheap rate; but, in addition to vegetables, fruits, as apples, pears, apricots, &c. and even flowers, may be dried and preserved by the same process, and, owing to the rapidity with which the drying is conducted, the latter retain their natural colors almost as brightly as when first obtained from the garden. In confirmation of this, several dried specimens were shown to the meeting; and it was stated that others would be present at the great Exhibition, when it is hoped that additional information will be furnished on the subject.

Hot Springs of Abyssinia.—In the last scientific voyages made by M. Rochet d'Hericourt into the interior of Abyssinia, amongst other discoveries he mentions that of many sources of warm water amongst the mountains. One at Guil, he says, made the mercury rise to 70 deg. centig. at Hatefete. The sources are numerous; they there unite and form nearly a river, in which there are many little fish of from twenty to twenty-three millimetres (not quite an inch) in length, the water being at 40 deg. centig. The fish which live in this stream are named by Lacepede Cyprinodon minime. They live equally in soft water or in that of the sea, in warm water as in cold; they are distinguished, as the poceillies and the fondules, by their jaws, which are furnished with three rows of maxillary teeth, fourteen on each side.

The Great Britain steamship is now fitting up by Penn, of London, for the Atlantic trade, Captain Mathews is to command her.

A fine new steamship named the Pennsylvania has been built under contract by Captain Loper, of Philadelphia for the Philadelphia and R. F. Richmond, Va., Line.

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English and American Railroads.

MESSRS EDITORS.—Number 30 of your paper contains a letter from A. J. Downing, on English Railways. He gives us the fact that they make a great deal less noise than we do, but does not tell us why. I was delighted to see the article, and was in hopes he would go deeper into the subject, but, like many others, he neglects the essential part, *i. e.*, working details. I hope some Americans, conversant with railways, will, while on a visit to the World's Fair, take such notes of the superior management of English railways as shall produce a much-needed change in that of our own.

Although a native of New York, I served my apprenticeship on English built and managed railroads, in France, and have worked and rode on railroads in England, and can, therefore, speak from positive knowledge and experience.

In England the railroad is enclosed properly by the Company, and all persons other than those employed upon it, are prosecuted for trespass if found upon the Company's premises, except as passengers, and in that case they are not admitted upon the platform of the station until the train has arrived. All common roads are carried over or under the railroad, if possible, and if crossed on the level of the rails, then gates, with watchmen, are provided, and guards are stationed every mile or two on the line to keep the track clear and give notice of danger to an approaching train; these men are generally native citizens, and their salary is sufficient to support them. Thus you perceive the necessity of ringing bells and blowing whistles is done away with, and the engine drivers are relieved from that responsibility and consequent anxiety and fear of running over human beings and cattle, as well as teams and trains.

In this country the railroad is as much a thoroughfare for foot passengers as the common roads, because it is perfectly open, in every sense, to the public; the station houses are used as public property and rendezvous for loafers; and when a train approaches a station, it is generally through a crowd of men and horses, and in order to get to the platform without harm, it is necessary to make all the discord possible to frighten the one and the other off the track; and if, perchance, any one gets hurt, an investigation is established at once to see if the bell was rung, the whistle blown, etc. etc, and all means tried to lay the blame on the engineer, if possible.

The fences that line the road are built by the farmers through whoseland the road passes, and consequently there is no regularity of form or material, and in many cases no fence at all, or a mere apology for one. All road crossings are on a level with the rails, if possible, to avoid the expense of bridging. No gates or guards are placed at these crossings—merely a pit dug on each side of the common road, to deter cattle frompassing on the length of the road, a very ineffectual barrier,—and nothing to prevent them or a team from remaining or being on the crossing at the passing of a train. A small bell is placed upon the engine, to be rung on approaching these crossings, from within eighty rods, under a penalty for the neglect of the duty. It is the habit of the owners of cattle in the Eastern States to turn them out on the roads to feed, and then they find their way upon the railroad track, where the grass is more abundant than on the common roads. Here they are often killed by the trains passing, and it happens not unfrequently that they throw the train off the track, and cause much harm to life and property. On the New York and New Haven road there are 14 stations and 105 road level crossings; you may therefore judge how the engineer's time is occupied, and if he is altogether to blame if accidents do occur. The bell to be rung in all, exclusive of stations, 8,400 rods, in going 74 miles. The danger of the single track, however, exceeds all the rest put together. M. C.

New Haven, Conn., April 13.

[We are glad that our correspondent has spoken out for the engineers, and directed attention in such a practical, sensible, and comprehensive manner to the evils of the railway system. The whole system requires reformation, and it would be well for all the various railroad companies to have a Convention and consult about the best mode of action to carry out a universally improved system of American Railroad management.

For the Scientific American.

Illuminated Clocks.

I had, the other night, occasion to stand several hours by the City Hall, and consequently watching the time. The illuminated face of the clock does not at all answer the purpose intended. The figures are far too small in surface, as well as the hands which can scarcely be seen from a short distance. In Paris (my birth place), there are several clocks of that description; some are common dials, in front of which is a strong light with a parabolic or segment of a spheric reflector; they answer very well, the figures being large and heavy. One in particular is on the same principle as that or the City Hall, with inside light, but the face is of an opposite kind—the ground is dark and the figures transparent.

Another, which, in my judgment, answers the best purpose, is in St. Paul's church, Rue Saint Antoine. There is a common dial to show the time by daylight; and just above it is a small aperture which is illuminated as soon as it becomes dark. This aperture is divided in two parts—the upper one being large enough only to contain one of the twelve numbers of the dial, indicating the hours; and the lower one, one of the numbers 5, 10, 15, 20, and so on, indicating the minutes. Those numbers indicating the hours and minutes are set on a separate circle, which is moving at the proper rate, and brings each of them to the light, the upper ones changing every hour, and the lower ones changing every five minutes, by a sudden motion scarcely appreciable to the eye. This disposition permits figures to be made of a large size, and as all the surrounding parts are completely dark, there is no confusion, and the lighted numbers show to the best advantage, being cut out of a metallic circular plate, moving in front of an unpolished glass. E. B.

New York, 1851.

Walnut Leaves in the Treatment of Disease.

Dr. Negrier, physician at Angiers, France, has published a statement of his success in the treatment of scrofulous disease, in different forms, by preparations of walnut leaves. He has tried the walnut leaves for ten years, and out of 56 patients, afflicted in different forms, 31 were completely cured, and there were only four who appeared to have obtained no advantage.

The infusions of the walnut tree leaves are made by cutting them and infusing about a good pinch between the thumb and fore-finger, in half a pint of boiling water, and then sweetening it with sugar. To a grown person M. Negrier prescribed from two to three teacupsfull of this daily. This medicine is a slightly aromatic bitter, its efficiency is nearly uniform in scrofulous disorders, and it is stated never to have caused any unpleasant effects. It augments the activity of circulation and digestion, and to the functions imparts much energy. It is supposed to act upon the lymphatic system, as under its influence the muscles become firm, and the skin acquires a ruddier hue. Dry leaves may be used throughout the winter, but a syrup made of the green leaves is more aromatic. A salve made of a strong extract of the leaves mixed along with clean lard, and a few drops of the oil of bergamot is most excellent for sores. A strong decoction of the leaves is excellent for washing them.

The salutary effects of this medicine do not appear on a sudden—no visible effect may be noticed for 20 days, but perseverence in it, says M. Negrier will certainly effect a cure.

As walnut-tree leaves are plenty and cheap enough in America, and as the extract of them is in no way dangerous nor unpleasant to use; and as scrofula cases are not uncommon, a trial of this simple medicine should be made. In directing attention to it, good results may be expected. It is our opinion that every country has within its own borders those medicines best suited to the wants of its inhabitants—to discover where and what those medicines are should engage the attention of our physicians.

Electricity, Metals and Water.

MESSRS. EDITORS—The simple announcement that water could be readily converted into gases suitable for purposes of light and heat, by mechanical electricity, had nothing in it to startle the scientific world; but the statement that came with it, that water was convertible wholly into the one gas or the other at the option of the experimenter, raised a clamor among chemists that nothing short of years of demonstration will silence.

As a matter of some interest and perhaps useful amusement to your readers, I propose to show by argument and demonstration in as short a space as possible, that the experiments in the "decomposition" of water from Humphrey Davy's day up to the present time, have all been based upon two false positions; first that the decomposition was due to the passage of the electric current through the the electrolytes: and second, that two separate poles or electrodes were required to enter the electrolyte, such an arrangement being necessary to effect the first mentioned requirement. That these propositions are othodox, I quote Prof. Brande. "When the electrodes of the voltaic battery are brought near to each other in certain liquids . . . . . so that the *current of electricity passes through them*, decomposition ensues; that is, certain elements are evolved in obedience to certain laws; the water, for instance, yields oxygen and hydrogen. . . . . In these cases the ultimate and proximate elements appear at the electrodes; not indiscriminately, or indifferently, but oxygen and acids are developed at the mode, *or surface at which the electricity enters the electrolyte*, and hydrogen and alkaline bases at the cathode, or surface at which the electric current leaves the body under decomposition.

Now if it is shown that water can be decomposed by voltaic or other electrical action *without* a current of electricity passing through—or without two poles or electrodes conveying said current into the electrolyte, then all the fine theories of Faraday, Brande, Silliman, and others, must be set aside. In proof that water can be so decomposed or resolved into the gaseous state, I submit the following demonstration:—Make two half circles, one of zinc and the other of platina; solder them together so as to form a circle, and then immerse it in water sufficiently acidulated to act on the zinc, when hydrogen will be rapidly evolved from the platina. Where are the two poles? Or where is the current of electricity passing through the electrolyte? In the making of hydrogen with zinc and acidulated water, we say the oxygen goes to the zinc and forms itc oxide; when water is decomposed by the voltaic battery with a platina electrode for the negative, and a copper rod for the positive poles, we say that the oxygen goes to the copper and forms its oxide; but this little experiment with the ring raises a question as to the truth of these say-sos. The zinc of the ring can only yield or form its relative quantity of oxide in proportion to the hydrogen liberated, and as the platina does not oxidize, what becomes of the atoms of oxygen which, according to the atomic theory, must be liberated at the same time the platina is evolving hydrogen?

Without venturing to construct a theory, I will venture to remark, that it will yet be discovered that electricity combines with different metals so as to produce different results when acting on the same electrolyte, or, in other words, water may be wholly transformed into different sub-elements, by electricity in combination with different metals. Yours,

H. M. PAINE.

Working Sails by a Steam Engine.

A ship called the Medora, is about to sail from Glasgow, Scotland, for San Francisco, which has on board a small steam engine, intended to weigh the anchor, pump ship, hoist the topsails, and do any other hard hauling that may be required, in addition to hoisting out and in cargo. It is placed upon deck near the fore hatchway, and is covered by an erection about as large as a cook's galley.

American Association for the Advancement of Science.

CINCINNATI MEETING.—The next meeting of this Association will be held at Cincinnati, commencing on Monday, May 5th, inst., and will continue through the week. The Local Committee of Cincinnati have provided gratuitous entertainment for members attending, and will be in attendance at the Burnet House on Monday to direct members to the quarters assigned to them. The meetings are to be held at the College Hall, Walnut street. Thomas Rainey, Esq., is Secretary of the Cincinnati Session, and the Cincinnatians have made ample preparations for the entertainment of the *savans* belonging to this most respectable association. It is a source of no little pride to us in being able to point to so many eminent philosophers in our country, and to the hearty good feeling displayed by our own people, as is now exhibited by our friends in Cincinnati, in doing them honor. We hope that our scientific friends in the West will attend in solid column, as this is the first meeting of the Association in one of the Western States. We congratulate the people of Cincinnati in having such an able and efficient local Secretary as Mr. Rainey.

A Curiosity.

The Florida Sentinel says, "While Governor Brown was in Key West, he was presented by the Hon. A. Patterson with a miniature bust of Gen. Washington, found ten years ago, in the neighborhood of Mr. Patterson's premises, imbedded in the limestone which forms the island. The bust is of marble, and is evidently the work of a master. The expression is said to be identical with that of the famous statue of Washington at Richmond, allowed to be the best likeness in existence. The little bust is in a state of perfect preservation; all the delicate chiselling in the plaits of a ruffled shirt remaining as sharp and well-defined as ever, and the marble without discoloration. Across the shoulders is inscribed the word "Wasington"—a spelling which seems to indicate an Italian origin. In the same spot, two English guineas were found, the dates and inscription of which we did not learn. All were probably deposites by some freebooter of the olden time."

Magnificent Present.

We have just had the pleasure of seeing a a present sent by the King of Prussia to our countrymen, Prof. Morse, in acknowledgement of his success in perfecting his Electro-Magnetic Telegraph, which is pronouced by his Majesty's Commissioner, after comparison and expeliment, to be the most efficient of any in the world for great distances. The present consists of a magnificent gold snuff box, of elaborate workmanship and design, enclosing the Prussian Gold Medal for Scientific Merit. The medal has on the face the medallion head of the King, Frederick William the IVth, surrounded by exquisitely executed emblems of religion, jurisprudence, medicine and the arts; on the reverse, Appollo drawn by four fiery steeds, in the charriot of the sun, traversing the zodiac, while from the head of the god the rays of light are darting abroad.—[N. Y. Observer.

Amoskeag Machine Shop.

The Manchester Mirror says there is now being manufactured at this shop, "machinery for several muslin de laine mills, in different parts of New England, one we believe in Providence, and another in Woonsocket, R. I.—a fact showing that the high stand taken by the goods at the Manchester muslin de laine mills in the market is beginning to excite considerable competition among manufacturers. The machinery for the Manchester new mill, (muslin de laine) is also manufactured here. They have also an order from Lowell, for seventy carpet looms. The company intend to turn out two locomotives per month, during the present year."

A farmer in the neighborhood of Paisley, Scotland, states that, by putting garlic in the bottom of his grain stacks, he has for some years past kept them free from rats and mice. The garlic is placed at a sufficient distance from the corn to prevent its imparting a flavor.

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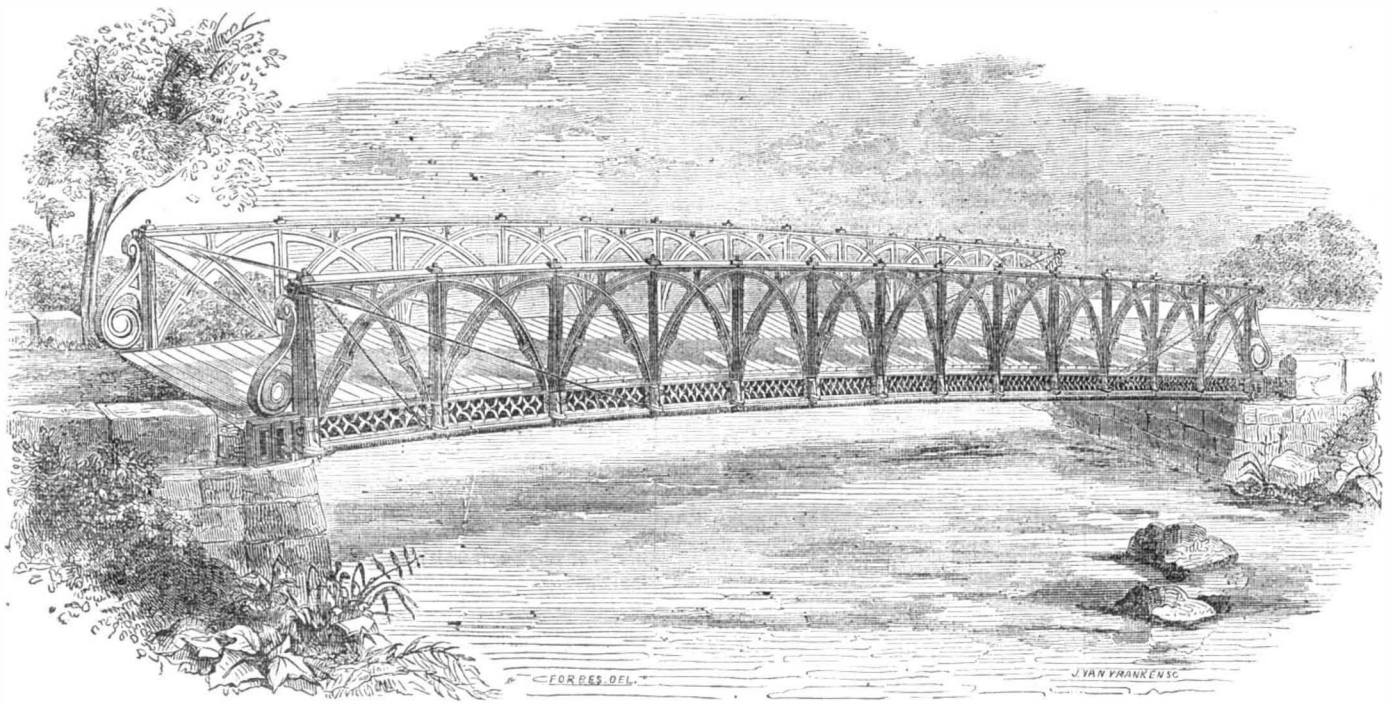
BENJAMIN SEVERSON'S IRON BRIDGE.

This bridge is the invention of Mr. Benjamin Severson, Schenectady, N. Y.

Fig. 1 is a perspective view of the bridge; it is cambered about 1 in 80 or 100, or a versed-sine of 1 to a chord of 80 or 100—the whole combined forming a trussed girder—a portion of a great circle. The sides or body of the trusses, when made of cast-iron, will be composed of pieces, or voussiors, with their upper and lower parts corresponding with the circle; their ends radial and the whole, together with the cable underneath them, to have one common centre. Thus, the upper and lower parts of the voussiors, and the tie beneath them, will form three concentric arcs. The ends and joints between the voussiors being radii, the lower arc or tie, will be the shortest of three arcs; and it will be impossible to bring the three arcs down to a straight line, (they being held parallel by means of the radial rods,) without extending the tie or shortest arc to the length of the two rigid arcs above it; or else compressing the two arcs to the length of the tie. This arrangement will insure a tightening of the whole system under the pressure of a load, and prevent the tie from becoming slack under any depression of the structure; but it would be otherwise if the tie were not acompanied by a longer and rigid arc. There may be more ties added to a truss, and they may be placed in a straight position, provided that they do not come below the highest part of the cambered tie; but it is important to have at least one of the ties in each truss cambered, as they will in this situation more effectually prevent vertical vibration; and for canal bridges it is important, in many situations, to camber the bridge to make room for the passage of boats, and yet keep the ends of the bridge as low as may be. To guard still further against vertical vibration in railroad bridges, a small wire cable or wrought-iron bar may be substituted and used tensionally, for the longitudinal binding effect of the caps represented in Fig. 2.

The quarter-braces, made of wire cables or wrought-iron rods, starting from the ends of the upper arcs and connected at different points to the lower parts of the voussiors, add much to the strength of the structure. At the middle of the length of the truss, the positive and negative forces act horizontally on the abutments. The amount of vertical pressure at intermediate points, is in proportion to the distance of each point from the ends of the middle of the truss; and regarding these braces as resultants, acting in the direction of their length, an analysis of the forces will show that the amount of vertical support given by each brace, will also be in proportion

Figure 1.



to the amount of vertical pressure occurring at their several points of construction with the lower part of the truss. And these braces being connected to the end pieces, opposite the ends of the upper rigid arc, and by means of screws made to press firmly against the ends of the arc, the arcs being cambered, it is evident that any downward bending of the structure will produce a horizontal thrust of the ends of the arcs against the upper ends of these braces; thus regulating the intensity of their tension, by the amount of pressure of a load on the Bridge,—hence, the amount of vertical support, rendered by each brace at its upper end, from the end of the arc bearing against it; thus the tension of the braces will at all times act with an intensity in proportion to the pressure of a load on the bridge.

It will be observed that the action of these braces comes within the length of the truss, and does not depend on a tower outside of it, as is the case with suspension Bridges; and therefore the whole will be alike affected by a variation of temperature, or contraction and expansion, and as the braces are straight, they will not produce any undulating, vibratory motion, which is entirely incompatible with the safety of a rigid structure; but undulation will always occur where the catenarian form of braces or suspenders is used, whether attached to a tower or confined within the length of the structure.

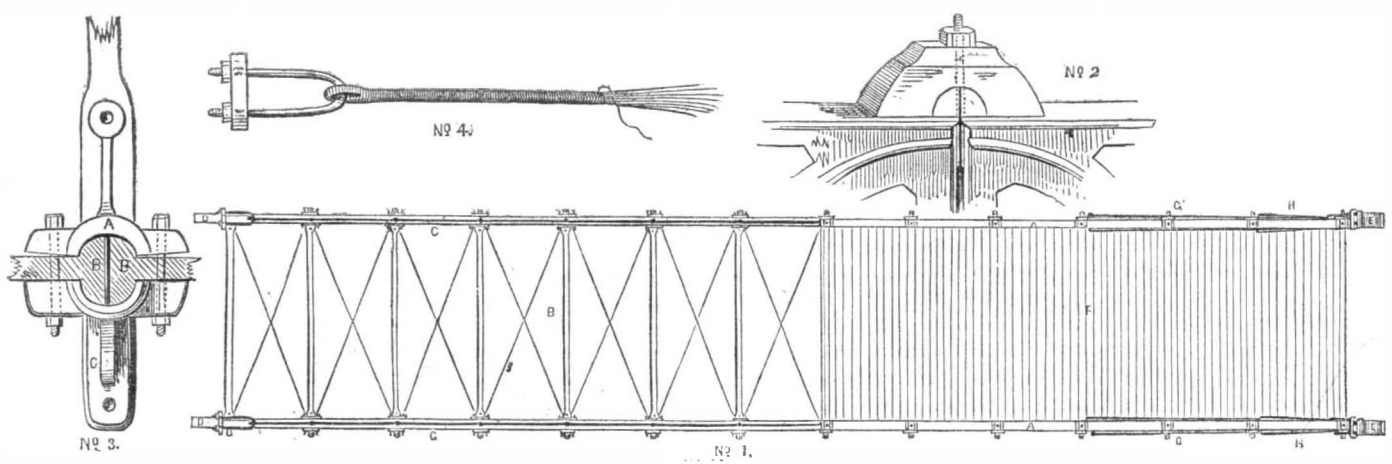
In No. 1, at F, is represented a portion of the floor as seen from above. A the upper rail, or arc. G G and H H the quarter-braces. E, end pieces. At B is half the bridge as seen from below. D D bottom of end pieces. C C main cables, or ties. The sway-braces and under side of girders between C C at B.

No. 2 represents the manner of joining the upper parts of two adjacent voussoirs, with a cap embracing circular raised parts of each; the cap, being held down by means of a screw and nut at the upper end of the radial rod, will bind the voussiors firmly together, and the joint between the three parts being circular, is simple and not liable to fracture, should any change occur in consequence of a slight settlement of the structure.

No. 3.—A is the end of the girder. B B lower part of voussoirs. C outside brackets made concave to correspond with the concave end of the girder, for the purpose of embracing convex parts of the voussoirs, B B. The whole to be firmly bound together by means of screw-bolts passing through the flanges of A and C. The circular form of joint is here also adopted to provide for any change that may occur in the bearing of the joints. There are two holes represented by dark spots in A and C through which to pass the lower ends of the radial rods. These rods are divided into two parts near the cap above. Their lower ends pass through the holes, and are secured by means of screws and nuts underneath the girder and bracket, A and C. Thus the radial rods form tensional braces to hold the upper arc or truss in line. When another roadway is added to the side of the first, its girders will take the place of the bracket, C Then the radial rods of the middle truss will pass through the ends of opposite girders.

No 4 is a portion of a wire cable, with a bow or staple-bolt, with screws and nuts by means of which the cable is drawn to a proper degree of tension.

This bridge is exceedingly beautiful in design, as well as being strong and durable in its construction. Bridges on this plan may be made of sufficient strength for railroads to



an extent of 500 feet span. A bridge built on this plan, 72 feet span, weight 14½ tons, was tested before Peter Rowe, Esq., Mayor of Schenectady, and some other gentlemen, who have published a certificate respecting its qualities and behavior. Forty-two tons of iron were left on it for 30 hours, without any sign being given that this was anything like a test of its strength. Besides the trusses for sustaining loads on this bridge, the girders and abutting end pieces are an addition to the truss of 72 feet clean span, and they are made strong and heavy to form a protection to the bridge. The four ends weighs each 505 lbs. The 13 beams weigh each 590 lbs.—9,690 in all, which, when deducted from 14½ tons, the entire weight of the bridge, will bring the metal in the sustaining parts to less than 10 tons.

Messrs. Clute, Brothers, of the Schenectady Foundry and Machine Shop, make this bridge, and communications sent to them will meet with prompt attention, and what they undertake to do we know will be well done.

Improvement in Presses.

Mr. George B. Whiting, of Harvard, Worcester Co., Mass., has invented a very novel and ingenious press, for which he has taken measures to secure a patent. The press is constructed with three circular thick metal plates having spirally inclined ways upon their faces which are placed towards each other with metal balls between them. The middle plate has cog teeth upon its periphery extending nearly around it; into this is geared a worm screw on a shaft, which, by turning, causes the said plate to revolve, and the balls—(or rollers may be used) to travel down the spiral inclines. The top and bottom plates, not moving round, are acted upon by the balls running in the inclined faces, so as to push down the lower plate to act with great force as a platten in the compression of any material that may be placed between it and the bottom part of the frame.

This press is adapted to press cotton, tobacco, paper, books, and bales of any kind of merchandise.

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Scientific American

NEW YORK, MAY 3, 1851.

Paine's Light.

In our last week's number we published an illustrated description of the invention of H. M. Paine, of Worcester, Mass. The engravings and description were derived from the English patent, as published in the Repertory of Inventions, of which the agent who took out the English patent is one of the proprietors. We stated that the specification was presumed to be full and explicit, as a very small flaw—ambiguity, defect &c., destroys an English patent; and as an English patent is twenty times more expensive than an American one, it is reasonable to suppose that according to the amount expended so would care be exercised in guarding against all contingencies.

Our opinion about the invention, as derived from the specification, and we have examined it in three different London periodicals, is not a favorable one. It has confirmed us more and more in the opinion we have expressed and entertained, "that water cannot be decomposed by electricity generated by mechanical force, so cheaply as by direct chemical action," and the idea held out by Mr. Paine, that a far greater force was obtained than the mechanical force exerted, is no where touched upon in the specification—all is dark and will remain dark, according to our mode of reasoning, until the laws—the unalterable laws—of physics are changed, and that cannot be by human powers.

The machine used by Mr. Paine, with the exception of the tubular coils, was invented by an ingenious American who has long resided in England, Mr. Saxton. Dr. Wallaston decomposed water by the electric spark, more than fifty years ago, but he always found it resolved into the two elementary gases, oxygen and hydrogen, and there is nothing in the specification referred to, that would lead us to think otherwise; indeed we are perfectly positive that water cannot *all* be resolved into hydrogen, or all into oxygen, nor is there a single word said in the specification about how this can be accomplished. Whenever we see an apparatus which we can handle and use at pleasure, whereby we can by one pole alone resolve water entirely into hydrogen, or entirely into oxygen by the other pole, then we will believe, and frankly and publicly confess that we were in error. We have no selfish motive in expressing our opinions, but it is our custom not to express one opinion, and entertain a different one.

Light and Heavy Locomotives.

Mr. England, of Hatcham, England, forwarded a light locomotive on the 3rd of August, 1850, to the Edinburgh and Glasgow Railway, Scotland, under the guarantee that it was to work the express trains between Edinburgh and Glasgow, consisting of seven carriages, to keep good time, per time bill, and not consume more than 10 lbs. of coke per mile, and if it did that to the satisfaction of the company's engineer, Mr. Adie, £1,200 ($5,820) should be paid for it. If the work was not done satisfactorily, the engine was to be taken back entirely at Mr. England's expense.

Mr. Adie has made a report on the working of this locomotive, and it is one of great interest. One of the best engines of the company was appointed to run from the opposite end of the track at the same hours, and with a similar train. These two engines worked a week in this manner, the "Little England," starting on the morning trip from Glasgow, and the large engine, the "Sirious," from Edinburgh; the result was, the little engine kept better time than the large one, and consumed only 8 lbs. 3 oz. of coke per mile, while the large engine consumed 29 lbs. 1 oz. The little engine frequently ran a mile in sixty seconds. She started with less slipping, and could be brought to stand at a much less distance than the large one. This little engine ran up an incline of 1 in 72 feet, for three miles, at the rate of 30 miles per hour, with 8 heavy carriages. She is now running the express trains between Glasgow and Liverpool, with 5 carriages, and consuming only 6½ lbs. of coke per mile. This engine is 16 tons, and it does better work than the engines of 32 and 36 tons. There can be no doubt but the English have run to extremes in building heavy engines, and that against reason and common sense. The reform in light engines has commenced, and it is to be hoped that extremes will be avoided in this.

Reform of the English Patent Laws.

Lord Brougham has introduced a Bill into the House of Lords, which provides for a complete reform in the procuring of a patent. All the old forms and multiplicity of offices are to be pitched to *gingle de cootch.* The Lord Chancellor, the Master of Rolls, the Solicitor Generals of England, Scotland, and Ireland, are to act as Commissioners of Patents. These Commissioners are to make their own rules and regulations and appoint their own clerks, as is done in Washington. The petition for a patent is to be left at the Great Seal Office. The petition is to be examined by a proper person or persons, and upon a report of said Examiner, the Commissioners may cause a warrant to be prepared for the signature of the sovereign, after which the Lord Chancellor shall seal the letters patent, which shall be in force throughout the three Kingdoms, the Colonies, and the Isles. The patent fee is to be reduced to £130, or less than one half of what it now is for the United Kingdom. A large meeting has been held in Manchester, Mr. Fairbairn presiding, at which resolutions were passed recommending £10 as a high enough patent fee. The whole fee is not to be paid at once: £18, by Lord Brougham's Bill, will secure a patent for three years, after which £40 is to be paid for 4 years, then £70 for the next seven years. This is a sweeping reform, but £10 or £20 is a high enough fee, we think.

There is another reform we should like to see carried out, viz., to abolish the huge wax seal which is attached to an English patent. Let there be an embossed parchment seal used in its stead. It is one of the most foolish things imaginable to see a lump of wax weighing 7 lbs. attached to every English patent. Let our friends across the water ask for relief from the *pumpkin seal.*

The London Well Waters---their Action on Lead.

In a lecture recently delivered before the London Chemical Society, by M. Noad, so well known in America by his book on "Chemical Analysis," he described the results of investigations made by him on the waters of various London wells. In one well (Highgate) he got 12·57 grains of saline contents in the water: silica, 0·1120; sulphate of potash, 2·1306; sulp-soda, 1·1894; chloride of sodium, 1·2040; chloride of lime, 0·7390; nitrate of lime, 5·0150; nitrate of magnesia, 2·1331—12·5231. This water exerted a powerful action upon a leaden cistern in which it was kept; this was attributed to the extraordinary amount of nitrates in the water, the well not being far distant from an old churchyard. M. Noad stated that although the nitrates were not unwholesome in water, their powerful action upon lead should be strictly guarded against, and he emphatically warned the public against the practice of allowing any water intended for domestic use to remain stored up in leaden vessels. He had analyzed the waters from a spring in Clapham which exerted a powerful action on lead, and this water contained an abundance of those salts which chemists termed "preservative salts;" not a nitrate among them. They were, silica, 0·24; carbonate of lime, 15,09; carbonate of magnesia, 13·97; sulphate of lime, 15·32; sulphate of potash, 6·79; sulphate of soda, 10·77; chloride of sodium, 11·46; organic matter, 4·10—77·74. This water corroded lead with such remarkable energy that a thin cistern, in which it was retained, was eaten into holes in six months; the oxide of lead could be skimmed from the surface of the water. The corrosion took place in the summer months, and was attributed to the organic matter in the water. The artesian well waters of London also act with energy on lead. This is not attributable to organic matter in them, as they are very pure, but to the alkaline qualities of the water. We must say that people cannot be too careful of the waters they use. Some are more sensitive to lead poisons than others, but they are dangerous to all, and therefore should be guarded against with untiring vigilance.

Quick Passages. Lieut. Maury's Charts.

Quite a large document of 126 pages, and well printed, has been issued by the authority of the secretary of the navy, Honorable William Graham, and the Chief of the Beaurau of the Ordinance Department, Commodore Warrington. The document is a very important one, as it contains the investigations of Lieut. Maury, of "the winds and currents of the sea." It states that of all the vessels which arrived at San Francisco from Atlantic ports, in 1850, the six American vessels which made the shortest passages had "wind and current charts" on board, and the six without these charts, which made the next shortest, averaged 14 days longer.

The wind and current charts of Lieut. Maury embody the results of the experience of officers in both public and private vessels, and numberless voyages through a long course of years. In regard to winds and currents in all parts of the ocean, they afford certain aids for shortening the average time of vessels in their passage to foreign ports, and even along our coast. The track of vessels and the character of winds, in a series of years and months, are given without confusion, by means of varied colors, symbols, and characters. Lieutenant Maury's charts are receiving increased attention from foreign ship-owners, more especially the British, who see in the aids they furnish, and a practical application of the principles they have evolved, a sure means of increasing their knowledge and making rapid passages.

The winds and currents of the sea may be said to be a new and perfectly original branch of nautical science, of which Lieut. Maury is the founder, the enthusiastic and learned investigator.

On the 16th inst., Lieut. Maury sent Commodore Warrington a very singular and important paper, as a "Notice to Whalemen." It was derived from investigations carried on at the National Observatory, "with regard to the migratory habits and places of resort of the whale—sperm and right." He believes that the right whale of the Southern Ocean is quite a different animal from the whale of the North, and that the two are separated by an impassable barrier. The whale found on the east and the one on the west, in the Northern ocean, is the same,—showing that there is communication by sea around the North Pole. This interesting piece of information was called to the notice of Lieut. De Haven, when he left on his expedition in search of Sir John Franklin; and he was so much impressed with the information that he was going to observe the whales in the northern seas, and follow them as pilots. We hope the American expedition will come out at the west and discover the North-west Passage. Lieut. Maury believes the temperature of the sea to have much to do with the whale—the right whale delighting in the cold, and the sperm whale in warm water.

Woodworth Patent Case.

U. S. Circuit Court, Phila. Before Judge Grier, April 23d: Sloat vs. Spring. The jury in this case brought in a verdict for the plaintiff establishing the following points:

1. That William Woodworth was the original inventor of the planing machine patented Dec. 25, 1828.

2. That the re-issue patent for July 8th, 1845, embraces the same principles as the patent of 1828.

3. That the machine of defendants does infringe on the amended patent of July 1845.

The Judge said that he entirely concurred in the finding of the jury. He hoped that there never would again be found persons willing to come into court and swear that Wm. Woodworth was not the inventor of the planing machine for which he had received a patent. The title had been tried in nearly every Circuit Court in the United States, and after twenty-three years' litigation, all of which had terminated the same way, it was time to put an end to these suits. He would hold hereafter that the man who would come into court and swear that Wm. Woodworth was not the inventor of the planing machine was *prima facie* guilty of perjury. He hoped that counsel would not encourage any more opposition to the Woodworth patent, and would not permit persons to come into court and under oath testify to a matter which was manifestly different from the testimony they gave.

Shower Baths.—In the United States Circuit Court at Baltimore, Monday the 21st, before Judges Tanney and Heath, as we learn from the Americans of that city, the case of Ephraim Larrabee vs. Cortlan & Co., an action to recover damages for an alleged infringement of a patent right for the manufacture of shower-baths, was concluded by a verdict for the defendants. The plaintiff's counsel declined going before the jury, and a verdict was taken for the defendants under the instructions of the court. The case will be carried up to the Supreme Court by the plaintiff.

American Iron Houses.

It is well known that Mr. Bogardus, of this city, one of the most ingenious men that ever lived, is the inventor of the first iron house erected in America. This building is situated on the corner of Centre and Duane streets, this city, and is used by Mr. Bogardus as a manufactory. The last number of the Illustrated London News, has a beautiful wood engraving of this building, and it speaks in flattering terms of its beauty and construction. Although iron houses were first built in England, it generously admits that the said iron house is more ingenious and is superior to any ever built in England. Quite a number of these houses have been erected in this city; and a fine new building, about being finished in Baltimore, by Mr. Bogardus, has been highly praised for its architectural beauty and strength of construction. We take pleasure in recording our countrymen's efforts in ingenuity, taste, and skill.

Death of Commodore Barron.

The death of this distinguished officer took place at his residence in this city, yesterday afternoon about 5 o'clock, when he breathed his last sigh without pain and in full possession of the faculties of his mind. Commodore B. was in the 83d year of his age, fifty-three of which had been spent in the naval service of the United States, having entered the Navy on the 9th of March 1798.—[Norfolk, Va., Daily News, April 21.

[Commodore Barron was a very ingenious man and patented several very meritorious inventions. He took out a patent about 1830, we believe, for a fan moved by clock work to ventilate chambers and vessels. This invention we have seen revamped a dozen times since then by others, but he was the original inventor. He has lived to a good old age, and his life has been chequered with much of "weal and woe."

We hope our friend Fitzgerald, of the Philadelphia "City Item," will not omit to assign a proper place to us in the Great Pedestrian Tour of Editors. The programme seems so admirably arranged that we should dislike much to be among the missing. Could we not be yoked in with Mr. Scott or Mr. McMakin, in consequence of the corresponding attitude which exists between us.

Removals at Washington.

We see it stated that De Witt C. Lawrence, Chief Clerk of the Patent Office, has tendered his resignation, to take effect on the 1st July, also that Robert Mills, superintendant of buildings, is to be removed and W. P. Elliott appointed in his place. The person who is stated to be appointed in the place of Mr. Lawrence, is Gen. Roger Weightman. We see it stated, also, that the Secretary of the Interior has appointed Mr. Stansbury, (who kicked up the dust lately) to take drawings of, and make a report of the exhibition buildings. This is a job for which the patent fund we hope will not have to pay; we will keep a look out and watch this affair.

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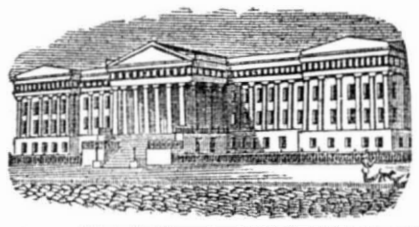

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING APRIL 22, 1851.

To Jonathan Ball, of New York, N. Y., for improvement in means of Renovating and Converting Sight.

I claim the cups and caps, to produce a pressure upon the periphery, in case of old age, or front of the eye, in case of near sight, which will increase or diminish its convexity, as the nature of the case may require, with their application as set forth, using for that purpose any of the materials named in the above specification.

To C. W. Grannis, of Gowanda, N. Y., for improvement in Cooking Stoves.

I claim first, the arrangement of the flues which conduct the heated air to the space under the oven bottom, from which it is discharged into the oven at the corners thereof, and without any enlargement to permit the expansion of the air before it reaches the oven, as described, when this is combined with the arrangement of fire flues on each side thereof, as described, whereby the air, passing to the oven is heated along the whole distance of its passage, by the products of combustion from the fire place, as described.

I also claim the heating of the air in its passage through the back hot-air chambers, by combining with such air chambers and the main fire flues, the branch fire flues which pass back of the said air chamber, substantially as described.

To James Reynolds, of New York, N. Y., for improvement in machines for Gutta Percha Tubing and covering wire.

I claim the use, for the purposes specified, of feed rollers, in combination with the stomach, having a lip or mouth arranged and operating substantially as described.

To Bradford Rowe, of Albany, N. Y., for improvement in machines for Stretching Leather.

I claim the method or device of stretching leather, especially for belting, by the use of apparatus so arranged that after a piece of leather has received, by an equable strain applied to its ends for their whole width, the proper stretch that the material can bear on or along one edge thereof, if it be found that the other edge and parts intermediate between it and the first edge (from the difference in quality of fibre), has not received proper tension, the further stretching of the first side shall be stopped, whilst, by the application of the mechanical stress, at the other edge of the leather, it, and the parts between it and the first side shall be duly stretched, substantially in the manner set forth.

I claim the holding board as essential, in all leather stretching apparatus, where it can be applied in keeping the material, whilst being stretched, from contracting in width and becoming defective thereby.

I claim the holding board, with its clamps and wedges, in combination with the apparatus for stretching, for the uses and purposes substantially as set forth.

To C. W. Stearns, of Springfield, Mass., for improvement in Clogs or Pattens.

I claim the application of an elastic loop or strap attached to the sole piece, and going around the heel, substantially as described.

To Wm. Strevell & Daniel Brown, of Albany, N. Y., for improvement in machines for Stretching Leather.

We claim the construction of the stretching apparatus, by connecting the free rod to the clamp, by entering the end or tenon of the rod into a mortise with angular sides, and securing them together by a pivot pin, substantially as set forth.

To Wm. Clay, of Clifton Lodge, England, for improved apparatus for rolling tapered Metallic Rods. Patented in England Dec. 16, 1848.

I claim permitting the rollers to recede from each other, by means of the hydraulic apparatus, constructed and arranged substantially as described.

And secondly, the adjustable screw in conjunction with the apparatus claimed above, whereby bars of metal are enabled to be rolled taper for a portion of their length, and parallel for the remaining part thereof.

To Lemuel Hedge, (assignor to G. W. Hedge), of Brooklyn, N. Y., for improvement in Saw Mills.

I claim the method, substantially as described, of driving belt saws by the friction surface of two cylindrical pulleys, or drums, which gripe the saw plate below the wood which is being cut, but at some part of its tangent line, so that the strain to which it must be subjected in cutting, to keep it in the line of the tangent, shall not be at any part of its curved path; but this I only claim, in combination with straining rollers, which gripe the saw above the lumber on which it acts, the said rollers being controlled by a brake or the equivalent thereof, substantially as described, whereby the saw, during its action, is kept in a strained condition along its entire line of action, that it may cut in a straight line, and to avoid its being under tension when the flexions take place along the curved portions of its track, as specified.

I also claim, in combination with the mode herein specified, of driving a belt saw by means of cylindrical rollers or pulleys, the employment of a belt passing around the outer one of the said driving rollers, and applied to the outer surface of the saw, where it passes around the lower deflecting or guide pulley, substantially as herein described, by means of which the saw is bent by the pressure of the belt applied to its outer surface, instead of being communicated through the metal itself, thus avoiding, in a great measure, the tendency to break the metal.

And finally, I claim, in combination with the mode substantially such as herein described, of driving a belt saw, the employment of fenders or scrapers, interposed between the driving rollers and the wood to be sawed, and placed each side of the saw, as described, to catch the sawdust and conduct it away from the bight of the driving rollers or the saw, and thus avoid clogging.

To Edward Whiteley, of Boston, Mass., for improvement in Coffee Roasters.

I claim the combining or arrangement of the fire place or chamber of combustion, the roasting cylinder, and its surrounding chamber, substantially in the manner as described and represented.

Also the arrangement of the flue of the fire chamber with respect to the latter, and the enclosing chamber of the roaster, the said arrangement of the said flue consisting in carrying it over and in contact with the top of the said enclosing chamber, as specified.

I also claim the arrangement of the proving tube, within the hollow journals and central part of the roaster; not meaning to claim the device termed the proving tube, but simply the arrangement as specified.

To T. F. Wingo, of McLemoresville, Tenn., for improvement in Straw Cutters.

I claim the manner herein described, of arranging one or more cutters on the periphery of a vertical wheel, at such angle with, and so extending over the face of said wheel, as will give a "drawing cut" through the straw or other material, as it falls, to the opposite side of the wheel from where it is cut; thus removing the cut material out of the way of the feeding box and uncut material, as fully set forth.

To R. Stilwell, of New York, N. Y., and E. L. Brundage, of Troy, N. Y., for improvement in Car Seats.

We claim the mode herein described, of reversing the back of car seats from one side of the seat to the other, without turning them over, by means of arms constructed and arranged as set forth, by which any desired height of back is obtained, as described.

Secondly, we claim the manner herein described, of reversing the concave back on a movable frame, in combination with the side locking projections, as described.

To James R. Bugbee, of Boston, Mass., (assignor to J. R. Bugbee & Enoch Robinson, of Somerville, Mass.), for improved Lock and Key.

I claim the wedge or cam key and the separate bitt, or secondary wedged or cam key, in combination with the vibrating block, the key recess and the tumbler elevators; the whole being constructed, arranged and operating substantially as specified.

To Jehu Hollingsworth, of Zanesville, Ohio, for improvement in Smut machines.

I claim the manner herein described of scouring and freeing wheat of smut and other impurities, by throwing up the grain on to the inclined face of a chimney, fitted to an opening along the top of the concave, in combination with the inclined aprons, for transferring the grain from end to end of the cylinder, that it may be discharged, as set forth.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

[Continued from page 254.]

On leaving the condenser the gas still contains ingredients which are useless, and may be considered as impurities, these consist of carbonic acid and sulphuretted hydrogen, the latter of which not only burns with a slight evolution of light, and only tends to dilute the gas, but becomes very obnoxious when escaping in an apartment unconsumed; therefore it becomes necessary to remove these injurious gases before it is introduced into the premises of the consumer; for this purpose the gas, as it leaves the condenser is conducted into a purifier containing a solution of sulphate of iron, commonly called copperas; the copperas having a chemical affinity for the carbonic acid and sulphuretted hydrogen, they become partially neutralized by this operation; it is then allowed to pass into a second purifier containing slaked lime in solution, called cream of lime; this solution is obtained by the admixture of lime and water, commonly 1 bushel of the former to 24 gallons of the latter; this solution is kept in constant agitation in order to keep the lime in suspension, so that every particle of lime may be brought in contact with a particle of gas. The action of the lime upon the gas is somewhat similar to that of the copperas; the sulphuretted hydrogen and carbonic acid being absorbed by the lime and moisture, and the comparatively pure carburetted hydrogen flows off deprived of its pernicious gases.

Dry Lime is often used in the place of the solution of cream of lime; the apparatus, however, being different in construction; the lime is laid upon wires, wicker work or thin iron perforated plates placed a few inches apart, the gas being introduced at the bottom and allowed to pass through this series of plates, and then conducted off from the top. this method of purification has been very generally introduced into the gas manufactories of the southern cities, but the lime solution is deemed preferable in this vicinity, both as regards cleanliness and expense.

Caustic Soda is sometimes substituted for lime, and is well adapted as a re-agent; in small works it has become very generally introduced, giving great satisfaction, and will in all probability eventually supersede the lime.

Acetate of Lead has also been employed as a re-agent for the purification of gas, but it is not sufficiently cheap to warrant its introduction on a large scale. A weak solution of sulphuric acid has also been introduced as a re-agent but never has come into general use.

The most important impurity is sulphuretted hydrogen, it blackens metals and oil paintings when it is evolved with the gas and not ignited; when burnt it forms sulphurous acid and water. The presence of this feculence may be ascertained by wetting a piece of white paper with a solution of the acetate of lead, and allowing a jet of the gas to come in contact with it; a black precipitate of the sulphuret of lead is formed; if no sulphureted hydrogen is present the paper will only be slightly dissolved. This test should be frequently applied, and the purifiers should be replenished with fresh material, whenever the black precipitate is formed. The ammonia, which is brought over with the gas in a greater or less quantity, burns to nitric acid and water. According to Mallet, coal affords 1-5000 of its weight of ammonia, and the gas, before entering the purifiers, contains 1-300 of its volume; ammonia is deposited in the form of salts in great quantities in the condenser pipes, and may be collected with advantage and used as a manure or applied to the arts.

After the gas has gone through the process of purification, it is conveyed to the station meter, which is an instrument constructed for measuring the quantity of gas made; and where all the gas generated by the retorts is correctly registered. The principle of the meter, and the means by which these beautiful results are attained, can easily be seen by each consumer of gas upon examining his own small meter; the principles of both being the same.

From the meter the gas passes into the gas holder sometimes termed gasometer. It is of course understood that the gas is not consumed at the same time, nor in the same quantity as it is evolved from the retorts; the primary pressure in the latter would be too strong and also too variable for the production of gas flames; to avoid these evils, large cylindrical inverted vessels are employed, open at the bottom and dipping into water, as repositories for the gas, and also are intended, at the same time, and this is of great importance, to force the gas onward to its proper destination, with just the requisite amount of pressure for burning properly at the most distant point. If more pressure is required than the simple weight of the gas-holder itself will give, it must be evident that, by adding weight, any amount of pressure required can be obtained; and if there is an over-pressure it can very easily be obviated by attaching counter weights. The pipes which convey the gas into and from the gas-holder are conducted under the reservoir of water, and are brought above the surface of the water far enough to prevent its running into and filling them; to these pipes are attached the requisite valves for shutting off and letting on the gas. When the gas-holder is in the water, it is said to be scaled—that is, rendered tight; no gas escaping through the water, its density being so much greater that it will not allow it to pass. Gas-holders are generally constructed of iron, by sheets being rivetted together, and afterwards coated with red lead or coal tar, to render them air-tight, and to prevent the oxidation of the metal.

Until within a few years, it was considered not only expedient, but absolutely necessary to confine the gas-holder, and protect it by a building; but that is mostly abandoned by the engineers of the present day, and nearly all which have been erected within the past few years are built without any covering whatsoever; and the experiment has proved eminently successful, and the necessarily great expenditure of the building is thereby saved.

From the gas-holder the gas is conveyed through a "governor" (an instrument calculated to regulate and equalize the pressure between the holder and mains) into cast-iron pipes, called street mains; these mains branch out into small ramifications, of capacity sufficient to supply the maximum consumption, wherever it is deemed expedient by the manufacturers, and the wants of the public may require. From the mains the gas is conducted through supply pipes into the premises of the consumer, where it is attached to a meter of sufficient capacity to meet the wants of the consumer, where all the gas consumed is correctly registered; and from thence it is conveyed through service pipes, at the option of the consumer, until it appears at the burner in readiness to afford its cheerful and disseminating light whenever the will shall dictate.

J. B. B.

(To be Continued.)

Sponge is becoming quite an article of commerce at Key West, Florida.

The Duke of Brunswick and Mr. Green lately went over from England to France, across the channel, in a balloon.

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TO CORRESPONDENTS.

A. H., of N. H.—We have never known of such a plan for etching being proposed or used ; we believe it to be new and useful.

H. M. P., of Mass.—We could not insert yours this week.

E. E., of S. C.—We have investigated the subject of your inquiry and find that there is quite a difference between the two contrivances. The particulars concerning the matter will be communicated by letter in a few days—in the mean time you can go forward without danger.

O. A., of N. J.—The subject of your claim you will find in Letters Patent granted to J. P. Gaume, of Cincinnati, Ohio, June 6th, 1848.

B. E., of Me.—You will see by reference to page 308, Vol. 3, Sci. Am., that John Keely, of England, has anticipated you.

W. E. A., of Mich.—The patent of Mr. Merrick was granted August 15, 1848.

I. P., of Geo.—In No. 179 of the London Patent Journal you will find an engraving of Bessemer's improvements in extracting saccharine juices. This is the invention referred to by us several months since, and has now been successfully operated in Demerara.

W. McA., of Ga.—We shall await your arrival and will endeavor to accommodate you immediately.

E. J. E., of Ohio.—You are in error : try an experiment and thus be convinced.

P. S., of Tenn.—You are required to make oath that you verily believe yourself to be the original and first inventor, without regard to place. If the same thing exists in another country, your patent could not stand.

H. E., of Pa.—The opinion of the Examiner in the Patent Office is entitled to little consideration. The point he sets forth is equal to one of Jack Bunsby's opinions.

E. D., of Me.—The machine you refer to was on exhibition at the last Fair of the American Institute, and operates essentially the same as yours. We can see no patentable difference, and advise you not to patent. The claim covers the combination of the rollers, reciprocating carriage, and springs.

H. P., of Iowa.—We presume that there is no reason for supposing any such thing; we have heard of no initiatory steps being taken to have the extension granted.

E. B., of N. Y.—You could not obtain a patent for the application of the screw to the raising or lowering the Cultivators. The contrivance is now used for other purposes, and the Patent Laws do not consider the change of application the legitimate subject of a patent. This opinion you may rest upon as conclusive in the case. We have forwarded you a copy of the Patent Laws, and express our thanks for your favor.

C. A., of Pa.—The engravings of your improved boiler are being executed, and will appear in the Scientific American in a week or two. The specification and drawings have been forwarded to the Patent Office, as you will see acknowledged under its proper head.

H. & W., of S. C.—S. S. Farrar & Co.'s check for $35 has been received and the amount credited to balance your account.

W. R. G., of N. Y.—W. has not yet received a patent. We do not believe you could get one, but we do not speak positively, as you say that you have made "an important improvement." All improvements are patentable, if new.

J. L., of Ill.—We could not understand your draught and description ; you were in too great a hurry, for the one did not accord with the other. It will not do to be so careless when important advice is asked and particular information requested. If you mean the improvement to consist in rack wheels connected with the reaches, then the improvement is not new. Look on page 236, Vol. 4, Sci. Am. ; the carriage there is similar to your drawing.

C. W. W., of Ohio.—Yours will meet with attention.

S. D., of N. Y.—A Belgian patent may be granted for 5, 10, or 15 years, at the option of the petitioner ; charges vary in proportion.

C. H. A., of Mass.—By the second section of the Act of 1842, you will notice the provisions on which patents are recorded that were lost prior to the 15th Dec., 1836.

J. D., of N. J.—We wrote you several days since, in regard to your business, and hope you will not neglect a reply, as it was done at your immediate request.

E. P., of Va.—By reference to Volume 3, Sci. Am., page 401, you will find an engraving and description of Blanchard's machine for turning irregular forms. It is capable of giving a minute fac-simile of any pattern.

S. C., of Pa.—You can have your foreign business transacted at this office : we possess every facility for attending to it in proper order.

J. F. J., of N. C.—We shall communicate with you as soon as possible in regard to the churn and the paper, in answer to your favor of the 25th May.

"J. P., of N. C.—You will get all the information you want, if you just take time and wait for the parts which are yet to be published on Hydraulics. It may be that you are in a hurry, if so we shall not let you lose by delay, if informed about your wants.

"W. D. D., of N. Y.—Your plan for bending eliptical springs is not so good, in our opinion, as the machines now in use for that purpose. It is not patentable, we believe.

S. J. M., of Pa.—Get an engraving of your invention published in the Sci. Am. It will be the means of bringing your invention into extensive notice, and help you materially in effecting sales.

E. A., of N. C.—In No. 23, Vol. 5, Sci. Am., you will find an engraving of Wood's Shingle Machine, which seems to combine all the principles involved in yours ; you are therefore advised not to make an application.

H. K., of London.—Upon application to Messrs. Barlow, Payne, & Parken, 89 Chancery Lane, you can ascertain such particulars as you desire.

E. A. C., of N. Y. City.—You will find, by reference to page 262, Vol. 7, London Patent Journal, that Wm. Payne, of London, obtained a patent for certain improvements in watches and clocks. He claims the adaptation of metallic springs to the production of chimes or musical sounds in clocks and watches ; this, you will at once see, is like yours.

J. A. C., of Miss.—In the invention referred to, the steam, after circulating through the coil in the evaporating pan, is passed into another coil placed in a cistern, from which the evaporating pans are supplied so as to heat the fluid before introducing it thereto.

W. G. W., of Mass.—A may obtain a patent ; nothing can hinder him ; the only danger in so doing lies in this : if the patentee sued for an infringement, the defence might be able to prove, owing to the sales, that the invention had been abandoned to the public ; this would make the patent void.

C. W. S., of Conn.—We don't know were the mats are manufactured. Any coarse strong comb answers the purpose. On another page you will find something to suit you.

H. W. B., of Vt.—Yours will be noticed by-and-bye.

C. H. W., of Boston.—The plates alone are what is valuable about the Iconographic Encyclopedia. The letter press is not so valuable.

J. P. M., of N. Y.—We still cannot see how your rudder could be steered easier ; both of its blades form radii of a circle, and act as levers ; the resistance, therefore, would be equal to the single blade of a diameter equal to the two radii. Capt. Brown, of Warren, R. I., is the inventor of a peculiar rudder, a balance rudder, but very different from yours. You will shortly see a paddle-wheel in the Sci. Am. nearly like yours ; and if you examine Vol. 5, Sci. Am., you will see an oblique paddle exactly like it.

Money received on account of Patent Office business since April 23 :—

C. H., of Pa., $30 ; J. B., of Mich., $53; C. A. W., of N. Y., $35; D. & R. P., of N. Y., $30 ; C. A., of Pa., $38; C. F. B., of R. I., $56 ; M. F. G., of Iowa, $35.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since April 23 :

J. G., of Mass.; J. V. S., of Iowa; H. R. R., of Vt.; W. & N., of N. Y.; A. J., of S. C ; M. F. G., of Mich.; C. A., of Pa.; C. F. B., of R. I. (two) ; J. M. L., of N. Y.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office ; stating the name of the patentee, and enclosing one dollar as fee for copying.

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" 16 lines, $1,00 " "

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Branches of our Agency have been established in London, under the charge of Messrs. Barlow, Payne & Parken, celebrated Attornies, and Editors of the "Patent Journal ;" also in Paris, France, under the charge of M. Gardissal, Editor of the "Brevet d'Invention." We flatter ourselves that the facilities we possess for securing patents in all countries where the right is recognized, are not equalled by any other American house. MUNN & CO.,
128 Fulton street, New York.

TO MACHINE SHOPS.—Received, this week, at Leonard's Machinery Depot, 109 Pearl, and 60 Beaver st., three superior Engine Lathes, 9 and 10 feet beds, 24 in. swing, screw feed ; also a full assortment of Universal Chucks and Chucks for Planers.
32 2 Address P. A. LEONARD.

HOVEY'S PATENT STRAW CUTTER.—Wm. Hovey, of Worcester, Mass., has opened a wareroom for the sale of his Cutters, at 60 Court-and st., New York. WM. HOVEY, Patentee. 32 *4

LEONARD'S MACHINERY DEPOT, 109 Pearl st. 60 Beaver, N. Y.—The subscriber is constantly receiving, and offers for sale, a great variety of articles connected with the mechanical and manufacturing interest, viz., Machinists' Tools—engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, bolt cutters, slide rests, universal chucks, &c. Carpenters' Tools– mortising and tennoning machines, wood planing machines, &c. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing,—wrought iron shafting, brass and iron castings made to order. Cotton and Woolen Machinery furnished from the best makers. Cotton Gins, hand and power, and power presses. Leather Banding of all widths, made in a superior manner, from the best oak tanned leather, Manufacturers' Findings of every description—bobbins, reeds, shuttles, temples, pickers, card clothing, roller cloth, potato and wheat starch, oils, &c. P. A. LEONARD. 33tf.

SCRANTON & PARSHLEY, New Haven, Conn., will have finished by the 10th of May, 12 Slide Lathes, with 8, 10, and 12 feet beads ; these lathes swing 21 in., have back and screw gear, have over-head reversing pullies, all hung in a cast-iron frame, with drill, chuck, centre, and follow rest. S. & P. will also have 12 upright drill presses ready to ship at the same time ; they have also constantly on hand 5 and 9 feet power planers, the same as heretofore advertised in this paper. Hand Lathes and slide lathes constantly on hand. Cuts, with full descriptions and prices, of the above tools can be had by addressing as above (post-paid.)

PATENT CAR AXLE LATHE.—I am now manufacturing and have for sale the above lathes : they will turn and finish six sets per day, weight 5,000 lbs., price $600. I have also for sale my Patent Engine Screw Lathe, for turning and chucking tapers, cutting screws, and all kinds of common job work ; weight 1500 lbs., price $225, if the above lathes do not give good satisfaction, the money will be refunded on the return of the lathe, if within six months. J. D. WHITE,
32 13* Hartford, Conn.

IMPORTANT TO CARRIAGE MAKERS and Dealers.—Sprout's Patent Combined Carriage Springs are manufactured and sold by the Union Co., Bridgeport, Conn.; Wm. Wright & Co., Newark, N. J., and John B. Bell, Pittsburgh Pa. Proprietors—Sprout, Burrows & Co., Hughsville, Lycoming Co., Pa. For further description see circulars, which may be obtained at the above place. 32 2*

STEAM ENGINES AND BOILER—Several Steam Engines, now finishing, from five to fourteen horse-power ; also one of 15 and one of 25. Having just enlarged my manufactory, I am now prepared to make all sorts, from 2 to 50 horse-power, of the best materials in all their parts. One second-hand engine of 8 horse-power, two cylinders, in good order, for sale, with new boiler, $575. Also Galvanized Chain for chain-pumps. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 32 1*

FOOTE'S INFALLIBLE COUNTERFEIT Bank Note Detector at Sight : applicable to all Banks in the United States, present or future ; illustrated with steel plate and diagrams ; highly recommended by bankers and brokers. Price $1,00, including a magnifying glass (mailable). Address
MUNN & CO.,
3oew‡ Office of the Scientific American.

LAWRENCE SCIENTIFIC SCHOOL.—Harvard University, Cambridge, Mass.—Special Students attend daily, from 9 o'clock, A.M., till 5 o'clock, P. M., in the laboratories, and under the direction of the following Professors :—Louis Agassiz, Professor of Geology and Zoology ; Jeffries Wyman, M. D., Professor of Comparative Anatomy ; Henry L. Eustis, A. M., Professor of Engineering and Physiology ; Eben Norton Horsford, A. M., Professor of Chemistry. Instruction is also given by Prof. Pierce in Mathematics ; Prof. Lovering, in Physics, and the Messrs. Bond at the Astronomical Observatory. All lectures delivered to under-graduates of the College are free to members of the Scientific School. For further information apply to E. N. HORSFORD,
29 6* Dean of the Faculty.

LATHES FOR BROOM HANDLES, Etc. We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds ; Hoe Handles, Fork Handles, and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
At this Office.

1851 TO 1856—WOODWORTH'S PATENT PLANING MACHINE.—Ninety-six hunhredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Patent Machines, which may be seen in constant operation in the steam planing mills at Boston, Philadelphia, New York, Albany, Troy, Utica, Rome, Syracuse, Geneva, Albion, Lockport, Buffalo, Jamestown, Gibson, Binghampton, Owego, &c. The price of a complete machine is from $100 to $1,000, according to size, capacity, and quality. Persons holding licenses from the subscriber are protected by him against infringements on their rights. For rights to use these machines in the Counties of Columbia, Dutchess, Queens, Richmond, Suffolk, Westchester, and other unoccupied counties and towns of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y.
27 eow6*

CLOCKS FOR CHURCHES, PUBLIC Buildings, Railroad Stations, &c.—The undersigned having succeeded in counteracting, effectually, the influence of the changes of temperature upon the pendulum, and introduced a new regulator, by which great accuracy of time is produced, also the retaining power (which keeps the clock going while being wound) are prepared to furnish Clocks superior to any made in the United States. Ample opportunity will be afforded to test their performance, and those not proving satisfactory, when completed may be rejected. Astronomical Clocks made and warranted equal to any imported.

Glass (Illuminated) Dials of the most beautiful description furnished on. Address
SHERRY & BYRAM,
Oakland Mills, Sag Harbor, L. I.

"Mr. Byram has established his reputation as one of the first clock makers in the world"—[Scientific American.

"Mr. Byram is a rare mechanical genius."—[Journal of Com. 29 12eow*

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

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27 8*

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Scientific Museum.

Skins for Door Mats.

A correspondent in a letter says, he has been reading numbers 16 and 17 of Vol. 5, Sci. Am., wherein are described processes for dyeing sheep skins for door mats. He now desires to know how these skins are tanned, the natural grease removed, and how prepared for dyeing.

Take the skins as fresh as they can be procured, and steep them for about half an hour in a weak ley of potash or soda, (do not have it very strong). This reduces some of the grease to a saponaceous compound. After this take and scrape the fleshy side with a dull edged knife (a hoe blade is a first rate instrument). The skin should be laid upon an inclined table or bench to perform this operation well. After this it should be handled in a strong solution of soap suds,—mind, strong—carefully squeezing it between the hands, for about twenty minutes, after which it is taken out and washed. A tub of clear water (25 gallons) is made up, and about one lb. of alum dissolved in water is added and the skins steeped in this all night. In the morning they are taken out and hung up to dry, by nailing them on a fence or wood racks with tacks, to keep them full stretched while drying, when dry very strong alum water is put on the flesh side with a sponge, and also rubbed into the roots of the wool, then dried again. This operation is performed three times, when the mat will be finished and be a beautiful white. The alum tans the skin and is a preparation for any color, yellow, blue, red, orange, purple, &c. No sumac may be used for door mats unless they are to be of a black color, the sumac in that case is a good preparation; yellow mats may be tanned with quercitron (yellow oak bark) and alum, or muriate of tin may be used in place of the alum.

For the process of dyeing the mats we refer our readers to the pages of Vol. 5, designated above.

New Steam Navigation Act.

There is a bill in the British House of Commons (brought forward by Mr. Labouchere) to consolidate and amend the laws relating to the regulation of steam navigation, and to the boats and lights to be carried by sea-going vessels. There are forty-nine clauses in the bill. Some new regulations are to be made respecting steamboats which will prevent their being over-crowded. Steam vessels are to be surveyed twice a year, and the owners are to transmit the declarations to the naval department of the Board of Trade, which board will grant certificates, to be placed in conspicuous parts of the vessels. The number of passengers is to be limited by a certificate, and a penalty of 5s. to be enforced for every passenger beyond the number allowed. Persons forcing their way on board when vessels are full will be liable to a penalty of 40s., and 5s. penalty on persons who refuse to pay their fare or to quit a vessel. The Board of Trade are to appoint surveyors, and they are to be allowed to go on board and inspect vessels—parties obstructing them to be liable to penalties. Iron steamers are to be divided by water-tight partitions. The measure is to be called "the Steam Navigation Act, 1851."

Destruction of the Egyptian Pyramids and Temples.

A correspondent of the London Athenæum says that the northern pyramid of Dashour is now in progress of being converted into a stone quarry, in order to build some new palace or villa in the neighborhood; the tombs of Sakkara are used for the same purpose; the mounds of Abydus are ransacked for building materials; the temple of Erment is going for the same purpose; and temples have, within the last six years, been knocked down, and the materials removed from near Sheikh Fadi, entirely without the knowledge of travellers, to whom indeed, they have remained utterly unknown until now that they no longer exist.

Locks.

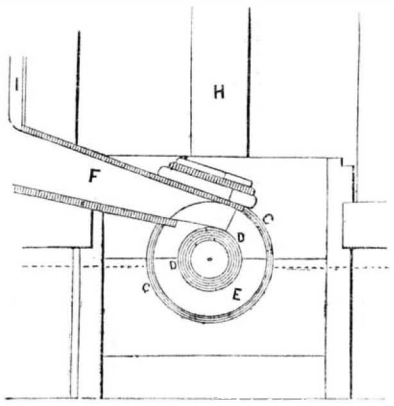
A correspondent writing to us says, "very few know what a good lock is, and are as liable to buy a poor as a good one. A powder proof lock is valuable, but such locks are high in price. If there was competition in good locks, the price might be reduced to come within the reach of every one. Bramah's is a very good lock, if nicely made; Yates' Patent Pin lock, the qualities and objections the same; Butterworth's is good, but I think it can be picked, so also can Chase's. I have one of Lillie's on my safe, and I think it the most secure of any that I have seen, but it can be broken much too easily by a burglar, although it would not benefit him in the least by doing so."

For the Scientific American.

Hydraulics.

(Continued from page 256.)

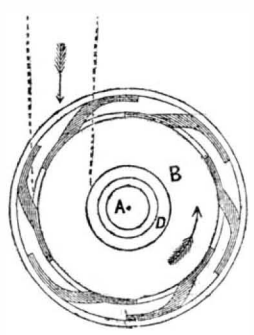
Fig. 45.



Mr. J. B. Conger, of Jackson, Tenn., writing us on water wheels, dated April 8th, 1851, says, "since 1830 an entirely new principle of action of water has been applied, and a great many patents were obtained for wheels embracing that principle, unknown to the inventors." In 1842, he states, the principle was thoroughly investigated by him, and Dr. Jones, of Washington, stated that it appeared to be founded on just principles and patentable. Owing to sickness, Mr. Conger did not secure a patent until 1842. The nature of the invention consists in arranging the shutes and wheel, that the water on entering through the shutes into a space between them and the wheel, is given a direction and velocity similar to that of the wheel, and a contrary direction on leaving it, with equal velocity, as relates to the wheel, but without actual velocity, thereby causing the wheel to stop the water entirely, at the same time that the wheel has a velocity of rotation equal to 0 7; that of the water, if allowed to escape freely from under the whole head, being 1.

Water, when issuing out from under one half the head, will have a velocity equal to 0·7, that of the whole head being 1; and if water pass through an aperture into an apart-

Fig. 46.



ment, from which it issues at an aperture of equal size—then the velocity at each aperture will be 7·10 of that due the whole head, and the pressure of the water in the apartment will equal one half that of the whole column.

I make the area of the cross section of the shute (or all the shutes), by which the water is let on to the wheel, equal to that of all the issues at which it leaves it, and from the buckets so that the top or part where the water enters is the curp of a cycloid, and the bottom or part where the water leaves, is a tangent to its vertex.

To produce a maximum effect, the shutes and issues of the wheel should be of equal size, and they move with the same velocity as the water, viz., 7·10 that due the whole head."

In our last number the principle of the action of the water was illustrated and described. The construction of a Re-action Wheel with the inlet water running in the same direction as the wheel, is of older date than the period mentioned by Mr. Conger, above. The accompanying engraving represents a vertical side elevation and a plan view of the buckets.

Figure 45 is a plan view of the buckets, showing by the arrows the motion of the water. A is the shaft; B is a water cylinder, fixed, and the water is admitted to it, as indicated by the arrow. D is the inside rim of this cylinder; its outside rim has an aperture through which the water passes through the buckets of the wheel, and is discharged at the circumference. The shaft works in the inside of the draft or cylinder, B, like as in a sleeve. The water discharges in an opposite direction to that shown by the arrow, and this is the reason why the inlet water and wheel move in the same direction, when the water is conveyed spirally to the wheel.

In figure 46 the wheel is placed on a horizontal shaft, and the inside of the cylinder only is shown. C is the outer and D the inner rim of the cylinder; E is the passage; F is the spout; I is the gate, and H is a hanging post, for the other end of the wheel shaft. A patente was granted for the wheel on the 19th Oct,, 1829, to Z. & A. Parker of Coshocton, Ohio. The claims for this invention were, —"1st, two or more wheels on one shaft, 2d, concentric cylinders enclosing the shaft; 3rd, the spouts which conduct the water into the wheels from the penstock, with spiral terminations between the cylinders." The conducting of the water on to the wheel with a whirling motion, and this motion in unison with the wheel is embraced in this patent, from the specification from which the above is taken.

In 1827, says Mr. Parker, a common reaction wheel was erected for a flouring mill on a small stream of water. The water entered it so as to revolve contrary to the wheel motion; while working it, a plank accidentally fell into the stream and changed its direction to that of the wheel's motion, when the wheel was observed to start off with a nearly double speed. By frequently repeating this experiment, it was found that the wheel had nearly double speed and power when the water entered it whirling with the motion of the wheel. Mr. Z. Parker then applied a spiral draft to a re-action gig wheel, in 1828, and the same wheel which made only 80 revolutions per minute, made 280, and with an aggregate orifice of 250 square inches it sawed 3,000 feet of lumber in the same time that a flutter wheel, at the same fall, with a gate of 400 square inches, sawed 2,000 feet.

Sale of Prof. Websters Apparatus and Chemicals.

The chemical and philosophical apparatus, which belonged to Prof. Webster, was sold at public auction in Boston, March 26.

What cost some four or five thousand dollars brought only about five hundred. But what was the loss of one party was the gain of the other—as it afforded some of our worthy and enterprising young chemists, who are in indigent circumstances a favorable opportunity for supplying themselves with much valuable apparatus.

The air pump, which cost some $150, was purchased by Mr. Weeks for $19,50, also most of the chemicals, which were said to have cost $1,500, were sold to Mr. Weeks for $90; a valuable apparatus for the condensation of carbonic acid was purchased by Prof. Hosford, of Cambridge for a quarter of its cost. The famous magnet of Lavoisier was purchased by a Mr. Alger for $5,25, and we understand he has refused an offer of $250 for it.

T. S. M., M. D.

Woburn, Mass., April 16, 1851.

Telegraph Speed.

Intelligence by telegraph is transmitted at the rate of 13,000 miles per second—this is fifteen times slower than that of light.—Cin. Gaz.

If the transmission of news by electric telegraph is only 13,000 miles per second, fifteen times slower than light, we must insist on having a telegraph operated by light. Electricity will not do for this age. 'Twill soon be reckoned a slow coach.—Exchange.

[The above commentators, we see require some light on the subject. Electricity travels at the rate of 200,000 miles, and light travels at the rate of 170,000 miles per second. It is one thing however to work with a swift messenger, and another thing to make the swift messenger work.

Flax In Ireland.

The annual flax sowing of Ulster averages 50,000 acres. For the rest of Ireland it is but 4,000. Supposing each of the other provinces to cultivate flax as extensively as Ulster, the value of the crop of all Ireland, it is estimated, would be £4,500,000.

The miners at the Cliff Copper Mine, Lake Superior, are at work upon a block of pure copper, 40 feet long, 18 high and three thick.

LITERARY NOTICES.

Graham's American Magazine, for May has several fine illustrations: "Spring Flowers" is beautiful, so also is the "May Queen." It embraces a brilliant list of original articles from James, Prentice, Hosmer, Herbert, Grace Greenwood, Mrs. Hemans, and others of known eminence in the literary world.

Sartain's Union Magazine, for May, is received. The embellishments are 19 in number, and are all done in the highest style of the art. The contributions are of high moral excellence from authors of reputation and character. Dewitt & Davenport are agents for both the above.

Shakspeare's Dramatic Works—Published by Phillips, Sampson & Co., Boston. No 37 of this beautiful serial is issued: it contains "Hamlet," with an elegant illustration of "Ophelia." This enterprising firm are about to issue Shakspeare complete Poetical Works, with Notes on the same, in one volume of 500 pages, which is to be ready on the issuing of the last number of the Dramatic Works—on paper and typography equal to them. The volume will be put up in various forms of binding for those who wish it separately, and untrimmed for those who wish to have it bound uniform with the rest of the author's works. We call the especial attention of our readers to the above.

The Carpet Bag is the title of a new paper just commenced by Messrs. Snow & Wilder, of Boston. It is one of the neatest sheets we have ever seen, and bears living evidence of success. Mrs. Ruth Partington is one of the ostensible editors, and affords the gratifying assurance of no decay. We wish the new Carpet Bag to supply the place of all the old ones.

Bulwer and Forbes on the Water Treatment—A compilation of papers on the subject of Hygiene and Rational Hydropathy, edited by Roland S. Houghton. Fowlers & Wells, publishers, 131 Nassau st. This compilation embraces the views of Sir E. Lytton Bulwer, Dr Forbes, and others of distinction, upon the importance of bathing, the whole forming an interesting and readable book of 258 pages. We have derived much pleasure from its perusal.

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